

SYLLABUS ¹

1. Information about the program

1.1 Higher education institution	Politehnica University Timisoara
1.2 Faculty ² / Department ³	Civil Engineering Faculty/Department of Land Communication Ways, Foundations and Cadastre
1.3 Chair	—
1.4 Field of study (name/code ⁴)	Civil Engineering/80
1.5 Study cycle	Bachelor
1.6 Study program (name/code/qualification)	Civil Engineering in English/10/Engineer

2. Information about the discipline

2.1 Name of discipline/ formative category ⁵	Soil and Rock Mechanics/DD						
2.2 Coordinator (holder) of course activities	Lecturer PhD. Eng. Ciopec Alexandra						
2.3 Coordinator (holder) of applied activities ⁶	Lecturer PhD. Eng. Ciopec Alexandra						
2.4 Year of study ⁷	III	2.5 Semester	5	2.6 Type of evaluation	D	2.7 Type of discipline ⁸	DI

3. Total estimated time – hours / semester: direct teaching activities (fully assisted or partly assisted) and individual training activities (unassisted) ⁹

3.1 Number of fully assisted hours / week	3 of which:	3.2 course	2	3.3 seminar / laboratory / project	1
3.1* Total number of fully assisted hours / semester	42 of which:	3.2* course	28	3.3* seminar / laboratory / project	14
3.4 Number of hours partially assisted / week	of which:	3.5 training		3.6 hours for diploma project elaboration	
3.4* Total number of hours partially assisted / semester	of which:	3.5* training		3.6* hours for diploma project elaboration	
3.7 Number of hours of unassisted activities / week	1,5 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			0.5
		hours of individual study after manual, course support, bibliography and notes			0.5
		training seminars / laboratories, homework and papers, portfolios and essays			0.5
3.7* Number of hours of unassisted activities / semester	21 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			7
		hours of individual study after manual, course support, bibliography and notes			7
		training seminars / laboratories, homework and papers, portfolios and essays			7
3.8 Total hours / week ¹⁰	4.5				
3.8* Total hours /semester	63				
3.9 Number of credits	3				

4. Prerequisites (where applicable)

4.1 Curriculum	• Physics, Building Materials, Chemistry
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¹ The form corresponds to the Discipline File promoted by OMECTS 5703 / 18.12.2011 and to the requirements of the ARACIS Specific Standards valid from 01.10.2017.

² The name of the faculty which manages the educational curriculum to which the discipline belongs

³ The name of the department entrusted with the discipline, and to which the course coordinator/holder belongs.

⁴ The code provided in HG no.140 / 16.03.2017 or similar HGs updated annually shall be entered.

⁵ Discipline falls under the educational curriculum in one of the following formative disciplines: Basic Discipline (DF), Domain Discipline (DD), Specialist Discipline (DS) or Complementary Discipline (DC).

⁶ Application activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).

⁷ Year of studies in which the discipline is provided in the curriculum.

⁸ Discipline may have one of the following regimes: imposed discipline (DI), optional discipline (DO) or optional discipline (Df).

⁹ The number of hours in the headings 3.1 *, 3.2 *, ..., 3.8 * is obtained by multiplying by 14 (weeks) the number of hours in headings 3.1, 3.2, ..., 3.8. The information in sections 3.1, 3.4 and 3.7 is the verification keys used by ARACIS as: (3.1) + (3.4) ≥ 28 hours / wk. and (3.8) ≤ 40 hours / wk.

¹⁰ The total number of hours / week is obtained by summing up the number of hours in points 3.1, 3.4 and 3.7.

4.2 Competencies	<ul style="list-style-type: none"> Using the scientific engineering fundamentals
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5. Conditions (where applicable)

5.1 of the course	<ul style="list-style-type: none"> Classroom having 35 seats. Support materials: laptop, projector, screen, blackboard
5.2 to conduct practical activities	<ul style="list-style-type: none"> Soil and Rock Mechanics Laboratory, blackboard, laptop, screen

6. Specific competencies acquired through this discipline

Specific competencies	<ul style="list-style-type: none"> Identify engineering problems regarding the behavior of soils under applied stresses
Professional competencies ascribed to the specific competencies	<ul style="list-style-type: none"> Design of structural elements in civil engineering, specific to graduated study programme Complying to quality and sustainable requirements for civil, industrial and agricultural constructions
Transversal competencies ascribed to the specific competencies	<ul style="list-style-type: none"> Documentation in Romanian and foreign language, in view of professional and personal development, via continuous learning and efficient adaptation to the new technical specifications

7. Objectives of the discipline (based on the grid of specific competencies acquired - pct.6)

7.1 The general objective of the discipline	<ul style="list-style-type: none"> The lecture is presented for undergraduate students from Civil Engineering. The topics of the lecture comprise the following aspects: to identify engineering problems regarding the behaviour of soils under applied stresses, to develop the relevant theories and to illustrate the application through worked examples typical of problems encountered in soil mechanics engineering.
7.2 Specific objectives	<ul style="list-style-type: none"> After completion of the lecture students should be able to analyze the soil behaviour under foundations, respectively to verify the bearing capacity of the foundation ground and the stability of soil masses, as slopes and retaining structures.

8. Content ¹¹

8.1 Course	Number of hours	Teaching methods ¹²
Geotechnical Investigations (Field Investigation Methods, Boring and Penetration Tests)	4	Lecturing, conversation, explanation
Particle Size Analysis and Physical Properties of the Soils (Particle Size Distribution, Analysis methods and Physical Properties of Soils)	4	
Soils Permeability and Water Flow in the Ground (Flow of Water	4	

¹¹ It details all the didactic activities foreseen in the curriculum (lectures and seminar themes, the list of laboratory works, the content of the stages of project preparation, the theme of each practice stage). The titles of the laboratory work carried out on the stands shall be accompanied by the notation "(*)".

¹² Presentation of the teaching methods will include the use of new technologies (e-mail, personalized web page, electronic resources etc.).

Through Soils and Dewatering Methods)		
Compressibility and Soils Consolidation (Process of Consolidation, Consolidation Test and Settlement Calculus)	4	
Shear Strength of Soils (Mohr-Coulomb Failure Criterion; Mohr's Circle Diagram; Shear Strength Tests (Direct Shear Test, Triaxial Compression Test)	4	
Lateral Earth Pressure (Active Pressure; Passive Pressure; Pressure at Rest; Rankine and Coulomb's Methods for Determining the Earth Pressure)	4	
Slopes Stability (Investigating Slope Stability: Total Stress Analysis, Swedish Method of Slices, Bishop's Method)	4	

Bibliography ¹³

1. L.P. Berry, D. Reid – An Introduction to Soil Mechanics, McGraw-Hill Book Company, London, UK, 1987
2. Ioan Petru Boldurean – Basic Elements of Soil Mechanics, Orizonturi Universitare Publishing House, Timisoara, Romania, 1999
3. I. Smith – Smith's Elements of Soil Mechanics, 8th Edition, Blackwell Publishing, Oxford, UK, 2006
4. R. Whitlow – Basics of Soil Mechanics, Longman Scientific & Technical, London, 1993
5. V. Haida, M. Marin, M. Mirea – Mecanica pamanturilor, Orizonturi Universitare Publishing House, Timisoara, Romania, 2004
6. A. Ciopec, M. Mirea – Practical Works in Soil Mechanics, Politehnica Publishing House, Timisoara, Romania, 2016

8.2 Applied activities ¹⁴

	Number of hours	Teaching methods
Particle Size Analysis: Sieving Method	2	Explanation, example, test, questions, discussion
Particle Size Analysis: Sedimentation Method	2	
Soils Permeability and Water Flow: Soils Permeability Tests	2	
Physical Properties of the Soils: Densities, Porosity, Void Ratio, Liquid Limit, Plastic Limit	2	
Soils Compressibility: Oedometer test	2	Explanation, example, test, questions, discussion
Soils Shearing Resistance: Direct Shear Test	2	Explanation, example, test, questions, discussion
Soils Shearing Resistance: Triaxial Compression Test, Monoaxial Compression Test	2	Explanation, example, test, questions, discussion

Bibliography ¹⁵

1. L.P. Berry, D. Reid – An Introduction to Soil Mechanics, McGraw-Hill Book Company, London, UK, 1987
2. Ioan Petru Boldurean – Basic Elements of Soil Mechanics, Orizonturi Universitare Publishing House, Timisoara, Romania, 1999

¹³ At least one title must belong to the discipline team and at least one title should refer to a reference work for discipline, national and international circulation, existing in the UPT library.

¹⁴ Types of application activities are those specified in footnote 5. If the discipline contains several types of applicative activities then they are sequentially in the lines of the table below. The type of activity will be in a distinct line as: "Seminar:", "Laboratory:", "Project:" and / or "Practice/training".

¹⁵ At least one title must belong to the discipline team.

3. I. Smith – Smith's Elements of Soil Mechanics, 8th Edition, Blackwell Publishing, Oxford, UK, 2006
4. R. Whitlow – Basics of Soil Mechanics, Longman Scientific & Technical, London, 1993
5. V. Haida, M. Marin, M. Mirea – Mecanica pamanturilor, Orizonturi Universitare Publishing House, Timisoara, Romania, 2004
6. A. Ciopec, M. Mirea – Practical Works in Soil Mechanics, Politehnica Publishing House, Timisoara, Romania, 2016

9. Corroboration of the content of the discipline with the expectations of the main representatives of the epistemic community, professional associations and employers in the field afferent to the program

- The discipline is in accordance with the ability of the civil engineers required by the civil engineering management and design companies.
- The content of the discipline was adapted to the requirements of the labor market, following the discussions in professional meetings or scientific conferences organized by civil engineering companies.

10. Evaluation

Type of activity	10.1 Evaluation criteria ¹⁶	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Answer to subjects from lecture and application area	Spoken exam: will be treated two subjects from the lecture content.	60%
10.5 Applied activities	S:		
	L: Solving problems corresponding to the laboratory works during semester time	Answer to questions regarding the solved problems or tests performed during the semester time	40%
	P¹⁷:		
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified ¹⁸)			
<ul style="list-style-type: none"> • To pass the exam it is necessary to obtain a minimum 5 (five) grade for each of the exam subjects, a minimum of 75% presence to lecture hours, the presence is compulsory to the laboratory works and it is necessary to prove knowledge learned during laboratory hours. 			

Date of completion

January 2018

**Head of Department
(signature)**

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**Course coordinator
(signature)**

**Date of approval in the Faculty
Council ¹⁹**

12.02.2018

**Coordinator of applied activities
(signature)**

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**Dean
(signature)**

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¹⁶ Syllabus must contain the procedure for assessing the discipline, specifying the criteria, methods and forms of assessment, as well as specifying the weightings assigned to them in the final grade. The evaluation criteria shall be formulated separately for each activity foreseen in the curriculum (course, seminar, laboratory, project). They will also refer to the forms of verification (homework, papers, etc.)

¹⁷ In the case where the project is not a distinct discipline, this section also specifies how the outcome of the project evaluation makes the admission of the student conditional on the final assessment within the discipline.

¹⁸ It will not explain how the promotion mark is awarded.

¹⁹ The endorsement is preceded by the discussion of the board's view of the study program on the discipline record.